

## REMARKS

### I. Introduction

Claims 1-4 are currently pending in this application. Claims 1-4 were rejected under 35 U.S.C. § 103(a).

For the following reasons Applicants respectfully submit that the claims should be allowed and the Application be passed to issue.

### II. Claim Rejections Under 35 U.S.C. § 103(a).

#### A. **Claims 1 and 2 over JP 2003-346888 in view of JP 2003-250913**

Claims 1 and 2 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over JP 2003-346888 in view of JP 2003-250913. Applicants respectfully disagree.

Claim 1 recites, in pertinent part, “said negative electrode active material layer includes 0.0001 to 0.003 wt% of Sb, and includes 0.01 to 2 wt% of condensate of bisphenol and aminobenzene sulfonic acid derivative.”

In order to establish a *prima facie* obviousness rejection under 35 U.S.C. § 103(a), basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must not be based on applicant’s disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Further, “rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F. 3d 977, 988 (Fed. Cir. 2006).

The Examiner concedes that JP 2003-346888 does not disclose that the negative electrode active material layer includes 0.01 to 2 wt% of condensate of bisphenol and aminobenzene sulfonic acid derivative, and therefore relies on JP 11-250913 for this alleged disclosure.

JP 11-250913 discloses a battery in which a decrease of the surface area of the negative electrode and the shrinkage of the negative electrode are inhibited, and thus the reactivity of the negative electrode is maintained, resulting in a longer life in a life test in which full charge and discharge are repeated (see JP 11-250913 paragraph [0027]), that is a life test in which charge and discharge are repeated at a high state of charge range. JP 11-250913 further discloses that the reduction in the capacity under low temperature atmosphere is inhibited.

As such, JP 11-250913 fails to disclose that the cycle life of the battery under lower capacity is prolonged, contrary to the Examiner's allegation on page 2 lines 11 to 9 from the bottom the Office Action.

However, in the present subject matter as recited in claim 1, when 0.0001 to 0.003 wt% of Sb, and 0.01 to 2 wt% of condensate of bisphenol and aminobenzene sulfonic acid derivative are added in combination to the negative electrode active material layer, the result is the unexpected advantageous effect of providing a lead storage battery with a long life under a specified mode in which charge and discharge are repeated frequently **under a low state of charge range** (in the use of a vehicle having a stop-and-go-system or a regeneration-braking-system). This is clear from Table 1 of the present specification.

Table 1 shows a comparison of the battery A in Example 1, in which 0.001 to 0.003 wt% of Sb, and 0.01 to 2 wt% of condensate of bisphenol and aminobenzene sulfonic acid derivative are added in combination to the negative electrode active material layer. Battery A in Example 1 corresponds to the battery recited in claim 1. Table 1 shows that battery A has a high discharge based on the number of cycles, of 51.

Moreover, Table 1 shows Comparative Example 2, battery F which includes antimony sulfate paste so that 0.001 wt % of Sb is included in the negative electrode, but that does not include the 0.01 to 2 wt% of condensate of bisphenol and aminobenzene sulfonic acid derivative. As such, the battery F of Comparative Example 2 corresponds to the battery of JP 2003-346888. Table 1 shows that battery F has a lower discharge of 26 as compared to the high battery life of 51 obtained from the battery as recited in claim 1.

Furthermore, battery G of Comparative Example 3, does not include any addition of antimony sulfate, but does include of 0.2 wt % of the condensate of bisphenol and aminobenzene sulfonic acid derivative in the negative electrode. As such, the battery G of Comparative Example 3 corresponds to the battery of JP 11-250913. Table 1 shows that battery G has a lower discharge of 23 as compared to the high battery life of 51 obtained from the battery as recited in claim 1.

Therefore, Table 1 shows that the battery A of Example 1 of the present disclosure has an unexpectedly increased discharge under a specified mode in which charge and discharge were repeated frequently under a low state of charge range.

Importantly, JP 2003-346888 and JP 2003-250913 are silent about adding Sb and 0.01 to 2 wt% of condensate of bisphenol and aminobenzene sulfonic acid derivative in combination to the negative electrode active material layer as recited in claim 1.

Moreover, the assessment of the Examples described immediately above, in which the battery F of Comparative Example 2 corresponds to the battery disclosed in JP 2003-346888 and the battery G of Comparative Example 3 corresponds to the battery disclosed in JP 11-250913, provides clear evidence that the configuration as recited in claim 1 and shown in battery A of Example 1, results in superior results that would not have been expected by a person having ordinary skill in the art.

Indeed, a person having ordinary skill in the art would not have found it obvious to add Sb and 0.01 to 2 wt% of condensate of bisphenol and aminobenzene sulfonic acid derivative in to the negative electrode active material layer as recited in claim 1, because the configuration as recited in claim 1 achieves an unexpected long life under a specified mode in which charge and discharge are repeated frequently under a low state of charge.

Therefore, Applicants respectfully submit that the rejection under 35 U.S.C. § 103(a) has clearly been rebutted by a showing of superior results obtained by the configuration recited in claim 1, which would not have been expected by a person having ordinary skill in the art.

As such, it is respectfully submitted that claim 1 is allowable over the cited prior art references.

Furthermore, claims 2-4 depend from and further define the subject matter of claim 1 and therefore are also allowable.

**B. Claims 1 and 2 over JP 2003-346888 and JP 62-064057 and JP 11-250913**

Claims 1 and 2 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over JP 2003-346888 in view of JP 62-064057 and further in view of JP 2003-250913.

Applicants respectfully disagree.

Claim 1 recites, in pertinent part, “said negative electrode active material layer includes 0.0001 to 0.003 wt% of Sb, and includes 0.01 to 2 wt% of condensate of bisphenol and aminobenzene sulfonic acid derivative.”

The Examiner concedes that JP 2003-34688 does not disclose a positive electrode connecting member and a negative electrode connecting member comprising a Pb-alloy including at least one of Ca and Sn, as recited in claim 1. Therefore the Examiner relies on JP 62-064057 for this alleged disclosure and relies on JP 2003-250913 for the alleged disclosure of a negative electrode active material layer including 0.01 to 2 wt% of condensate of bisphenol and aminobenzene sulfonic acid derivative.

As discussed above, a person having ordinary skill in the art would not have found it obvious to combine JP 2003-34688 and JP 11-250913 as the configuration recited in claim 1 achieves an unexpected long life under a specified mode in which charge and discharge are repeated frequently under a low state of charge.

As such, it is respectfully submitted that claim 1 is allowable over the cited prior art references.

Furthermore, claims 2-4 depend from and further define the subject matter of claim 1 and therefore are also allowable.

**C. Claims 1 and 2 over JP 2003-346888 and Omae et al., US 6,455,191 and JP 11-250913.**

Claims 1 and 2 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over JP 2003-346888 in view of Omae et al., U.S. Patent No. 6,455,191 (“Omae”) and JP 11-250913.

Applicants respectfully disagree.

As discussed above, claim 1 recites, in pertinent part, “said negative electrode active material layer includes 0.0001 to 0.003 wt% of Sb, and includes 0.01 to 2 wt% of condensate of bisphenol and aminobenzene sulfonic acid derivative.”

The Examiner concedes that JP 2003-346888 does not disclose a positive electrode connecting member and a negative electrode connecting member comprising Pb-alloy including at least one of Ca and Sn, therefore the Examiner relies on Omae for the alleged disclosure, and like the other rejections of claims 1 and 2 under 35 U.S.C. § 103(a), the Examiner relies on JP 11-250913 for the alleged disclosure of a negative electrode active material including 0.01 to 2 wt% of condensate of bisphenol and aminobenzene sulfonic acid derivative.

However, as discussed above, a person having ordinary skill in the art would not have found it obvious to combine JP 2003-34688 and JP 11-250913 as the configuration as recited in claim 1 achieves an unexpected long life under a specified mode in which charge and discharge are repeated frequently under a low state of charge.

As such, it is respectfully submitted that claim 1 is allowable over the cited prior art references.

Furthermore, claims 2-4 depend from and further define the subject matter of claim 1 and therefore are also allowable.

**D. Claims 3 and 4 over JP 2003-346888 and JP 11-250913 and JP 2003-338312**

Claims 3 and 4 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over JP 2003-346888 in view of JP 11-250913 and JP 2003-338312.

The Examiner relies on JP 2003-338312 for the alleged disclosure of a separator comprising a fiber having resistance to acids and a glass fiber.

However, JP 2003-338312 fails to cure the deficiencies of JP 2003-346888 in view of JP 11-250913, because as discussed above, a person having ordinary skill in the art would not have found it obvious to combine JP 2003-34688 and JP 11-250913 as the configuration as recited in claim 1 achieves an unexpected long life under a specified mode in which charge and discharge are repeated frequently under a low state of charge.

Therefore claim 1 is allowable over the cited prior art reference, either or alone or if taken in combination.

Furthermore, claims 2-4 depend from and further define the subject matter of claim 1, and therefore are also allowable.

**E. Claims 3 and 4 over JP 2003-346888 in view of JP 62-064057 and JP 11-250913 and further JP 2003-338312**

Claims 3 and 4 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over JP 2003-346888 in view of JP 62-064057 and JP 11-250913 and further in view of JP 2003-338312. Applicants respectfully disagree.

The Examiner relies on JP 2003-338312 for the alleged disclosure of a glass fiber. However, JP 2003-338312 fails to cure the deficiencies of JP 2003-346888 in view of JP 62-064057 and JP 11-250913, because as discussed above, a person having ordinary skill in the art would not have found it obvious to combine JP 2003-34688 and JP 11-250913 as the configuration as recited in claim 1 achieves an unexpected long life under a specified mode in which charge and discharge are repeated frequently under a low state of charge.

Therefore claim 1 is allowable over the cited prior art reference, either or alone or if taken in combination.

Furthermore, claims 2-4 depend from and further define the subject matter of claim 1, and therefore are also allowable.

**F. Claims 3 and 4 over JP 2003-346888 in view of Omae and JP 11-250913 and JP 2003-338312.**

Claims 3 and 4 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over JP 2003-346888 in view of Omae and JP 11-250913 and JP 2003-338312. Applicants respectfully disagree.

The Examiner relies on JP 2003-338312 for the alleged disclosure of a glass fiber.

However, JP 2003-338312 fails to cure the deficiencies of over JP 2003-346888 in view of Omae and JP 11-250913, because as discussed above, a person having ordinary skill in the art would not have found it obvious to combine JP 2003-346888 and JP 11-250913 as the configuration as recited in claim 1 achieves an unexpected long life under a specified mode in which charge and discharge are repeated frequently under a low state of charge.

Therefore claim 1 is allowable over the cited prior art reference, either or alone or if taken in combination.

Furthermore, claims 2-4 depend from and further define the subject matter of claim 1, and therefore are also allowable.

**III. Conclusion**

In view of the above amendments and remarks, Applicants submit that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

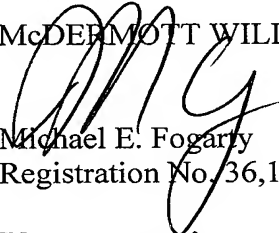


**Application No.: 10/589,464**

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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